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REVIEW OF PROPOSED MBMs

Grouping and evaluation of proposed MBMs

Submitted by Greece

SUMMARY

Executive summary:	This document explains the position of Greece as regards MBMs, and includes a proposed grouping and evaluation of the proposed MBMs. It suggests grouping the MBM proposals into the following four categories: 1. a Levy Scheme (the GHG Fund), 2. the different ETS variations, 3. all hybrid proposals, i.e. all proposals including an EEDI element, and 4. all other proposals. The document also proposes that for the time being only the first two categories should be further considered, with a Levy Scheme being the preferred option.
Strategic direction:	7.3
High-level action:	7.3.2
Planned output:	7.3.2.1
Action to be taken:	Paragraph 82
Related documents:	Circular letter No.3121; MEPC 61/INF.2, MEPC 61/24 (annex 7) and GHG WG 3/1

Introduction

1 Pursuant to the decisions of MEPC 61, the Secretary-General invited representations to participate and contribute to the Third Intersessional Meeting of the Working Group on GHG emissions from ships (GHG-WG 3). The group's Terms of Reference were approved by MEPC 61, as set out in annex 7 to document MEPC 61/24, and the provisional agenda is set out in document GHG-WG 3/1.

2 To assist the Intersessional meeting, Greece evaluated and grouped the various GHG MBM proposals and made a comparison between a Levy Scheme and an Emissions Trading Scheme (ETS). The document also justifies why the former should be the preferred option and makes remarks on the work of the Expert Group, as reflected in its report to MEPC 61 (MEPC 61/INF.2).

Greece's general position on MBMs

3 As a matter of principle, Greece has consistently supported the view that a multi-disciplinary approach is needed to address ship emissions reductions. To be successful, such an approach should take into consideration the availability of technology to reduce emissions, the need to encourage innovation, and the economics of world trade. It also must avoid the negative effects associated with an increase in CO_2 emissions when other pollutants are reduced (such as SO_x and NO_x).

4 Consistent with the above position, Greece endorses the nine fundamental principles for future regulations on GHG emissions from ships agreed upon by majority at MEPC 57 (MEPC 57/21, paragraph 4.73), which stipulate that future regulations should be:

.1 effective in contributing to the reduction of total global greenhouse gas (GHG) emissions;

.2 binding and equally applicable to all flag States in order to avoid evasion;

.3 cost-effective;

.4 able to limit, or at least, effectively minimize competitive distortion;

.5 based on sustainable environmental development without penalizing global trade and growth;

.6 based on a goal-based approach and not prescribe specific methods;

.7 supportive of promoting and facilitating technical innovation and R&D in the entire shipping sector;

.8 accommodating to leading technologies in the field of energy efficiency; and

.9 practical, transparent, fraud free and easy to administer.

5 Furthermore, Greece is of the opinion that the legal text of any mandatory requirement regarding shipping should be in line with UNCLOS and that every effort should be made to address the concerns of developing nations in order to ensure a global system.

6 In view of the above nine IMO principles, Greece's *a priori* position *vis-à-vis* MBMs is the following:

.1 Imposing inappropriate MBMs runs the risk of moving freight from ships to other modes of transport, thereby increasing overall GHG emissions to the detriment of the environment. This would be contrary to IMO principle 1.

.2 The costs associated with MBMs may adversely affect world trade and globalization (at this sensitive time of economic crisis), contrary to IMO principle 5.

.3 Some MBMs may distort competition and may therefore be detrimental to the world economy, contrary to IMO principles 4 and 5.

7 Nevertheless, if IMO decides in favour of MBM's, Greece is of the view that a Levy Scheme is to be preferred to an ETS, as will be explained below.

8 A Levy Scheme is aimed at internalizing the societal cost of CO_2 emissions. It is widely recognized that an efficient way to handle pollution is to put a price on it. A pollution levy re-establishes market forces. A levy is efficient in that, whatever level of emissions reduction is achieved, by a properly administered levy it will be achieved at the least cost to society, that is, with a minimum wastage of resources. This scheme is the simplest and most cost-effective way to reduce CO_2 emissions and is also consistent with the "polluter pays principle". It further avoids a multitude of problems associated with other proposed schemes, particularly those associated with ETS as will be explained below. Among the various MBM proposals, a levy closely relates to the GHG Fund proposal by Cyprus, Denmark, the Marshall Islands, Nigeria and IPTA (MEPC 60/4/8), but only if this MBM is applied in a certain manner, which will be explained below.

9 Greece wishes to point out that ships do not trade at predetermined speeds, as has often been suggested in previous MEPC discussions. Those who pay for the fuel, that is, the shipowner if the ship is in the spot market on voyage charter, or the charterer if the ship is on time or bareboat charter, will choose an optimal speed as a function of (a) bunker price, and (b) the state of the market and specifically the spot rate. The practice of slow steaming that has a direct and critical impact on CO_2 emissions is an operator's automatic response to both (a) and (b). It is not a measure that can be imposed effectively by regulators.

10 Yet, the Expert Group report (MEPC 61/INF.2, paragraph 8.12) states that owners of ships on time charter or bareboat charter may have less incentive to adopt measures for the reduction of fuel consumption since the fuel is paid by the time charterer and not the owner. This assumption is incorrect.

11 When a ship is fixed on time charter, the ship's speed and consumption are clearly described in the charter party. During negotiations, the ship's capacity, warranted speed and consumption are evaluated by the charterer. A ship with a poorer warranted speed and consumption will receive a lower charter rate than a ship with a better consumption curve. If during the charter the ship does not perform up to charter party terms, the charterer will lodge a claim on the ship and deduct monies accordingly as compensation for his contractual loss. English arbitration case law is full of such incidents. Under these circumstances the owner of a ship on time charter has every incentive to make every possible effort to economize on fuel consumption while on time charter.

12 A related but often overlooked fact is that even though the owner's and time charterer's speed optimization problems may seem at first glance different, for a given ship the optimal speed (and hence fuel consumption) is in both cases the same[1]. In that sense, from an emissions standpoint, it makes no difference who is paying for the fuel, the owner or the time charterer.

13 The same is true for bareboat charterers. The bareboat charterer becomes the disponent owner who deals with the ship's employment, operation, manning, stores, provisions, maintenance and repairs throughout the bareboat charter period according to the charter party terms agreed between the owners and the bareboat charterers. Therefore, the bareboat charterer, as disponent owner, is in full control of the operation and maintenance of the ship. Under the circumstances, any discussions with regard to the operation of the ship by the head owner are without a logical or legal base.

14 An obvious and effective way to induce slower steaming (and hence lower CO_2 emissions) is to increase the bunker price with a levy. In the short run, this will induce shipping to operate at slower speeds. In the long run, it will induce owners to invest in ships

[1] See Devanney, J. (2010), "The impact of bunker prices on VLCC spot rates," Center for Tankship Excellence, USA www.c4tx.org.

that are technologically more fuel efficient (they will have better hulls, engines, propellers and so on). Prices must be clearly identifiable and stable in order to affect shipping industry behaviour as a whole, as its capital intensive nature requires ample lead times. Erratic and unpredictable price signals will not produce the desired effect. Regrettably, Emissions Trading Schemes fall into that category.

15 In an economic boom, when ships are scarce, the value of a marginal tonne-mile to society is higher than in economic slumps, when ships are trading in surplus. This is reflected in the spot rates. In an economic boom ships operate at higher speeds since the cost of the additional fuel consumed is less than the additional income from the higher freight rates and the ability to fix another profitable cargo sooner. In an economic slump it is more profitable to trade at a slower speed using less fuel.

16 As both fuel prices and freight rates vary along a ship's life cycle, Greece believes that any attempt to formulate emissions regulations that ignore this fact is bound to be ineffective. A levy is the only MBM that can take this into account, and in fact accomplishes this automatically. It is also far less burdensome to administer as will be shown hereunder.

General comments on the Expert Group Report (MEPC 61/INF.2)

17 Greece is highly appreciative to all Experts, the Focal Points, the Task-Group Leaders, the IMO Secretariat and, last but not least, the Expert Group Chairman, all of whom must be highly commended for contributing to a report covering many complex issues in which difference of opinion among experts was not uncommon.

18 At the same time, Greece regrets that the report contains no recommendations on which, among the 10 MBM proposals, is or are preferable and which should be discarded. Nor does the report contain any direct horizontal comparison of these proposals with one another *vis-à-vis* the nine established criteria. Greece notes that the expert it nominated submitted a request to include in the group's report (at least) his own comparison of the proposals and some other remarks as a dissenting view but this request was not granted.

19 In addition to the comment on paragraph 8.12 of the Expert Group Report made in paragraph 10 of this document, below are some points which Greece would like to make to highlight issues that merit attention and discussion. Emphasis is made on issues for which Greece does not agree with the findings of the MBM-EG report.

Weak and strong drivers

20 A fundamental point of disagreement concerns the apparent conclusion of the report that the GHG Fund proposal (MEPC 60/4/8) is a weak driver for uptake of in-sector technological measures to reduce emissions (MEPC 61/INF.2, paragraph 9.62, 9.113), whereas the various ETS proposals (MEPC 60/4/22, MEPC 60/4/26, MEPC 60/4/41) are strong drivers (MEPC 61/INF.2, paragraph 14.60, 14.132 for Norway's ETS). This is not the case. In fact, a levy will result in a much larger reduction in CO_2 emissions than an ETS with the same average permit price.

21 To achieve the same amount of CO_2 reduction, if equal efficiency were to be assumed for both systems, which unfortunately is not the case (ETS being not as efficient), the Levy Scheme and the ETS carbon price would have to be the same. Policy-makers will have to choose either the target reduction (for the ETS proposal) or the target levy (for the Fund proposal). Either can be high or low. The target reduction and the target levy being the policy-makers' choice should aim at the same result, i.e. either the same target contribution or the same target reduction. If one goes for a modest target reduction, the

carbon price will be low, in fact close to zero according to the Marginal Abatement Cost (MAC) curves submitted by DNV to the MBM-EG. However, a levy can and should be fixed for a longer period (a year or more). Permit prices in an ETS by their nature are both volatile and unpredictable. Owners who are unsure of the carbon price will be facing great difficulties justifying expensive investments in carbon reduction technologies.

22 It is true that the exact impact of a particular levy is still unknown. Nevertheless, accurate estimations are possible. Devanney (2010)[2] estimates that with a base BFO price of $465/tonne, a $50/tonne bunker levy will achieve a six per cent reduction in total VLCC emissions over their life cycle. A reasonable estimate of the reduction for a $150/tonne levy is 11.5%.

23 The same applies to the revenues that will be generated, which are (again erroneously) postulated in the report to be higher for ETS than for the Fund (MEPC 61/INF.2, Figure 9-2 versus Figure 14-1). If carbon price and CO_2 reductions are the same in both schemes, revenues will also be about the same after accounting for efficiency. But as will be argued later, an ETS will be far more expensive to maintain, and (in that sense) less efficient. This means that in-sector CO_2 reductions for the GHG Fund proposal can be much higher than those shown in the report.

Table 1: Annual dry cargo transported *vs* freight market rates[3]

YEAR	TOTAL BTM* (a)	FLEET IN DRY* (b)	SUF** [(a)/(b)]	IABDI ***	YEAR	TOTAL BTM* (a)	FLEET IN DRY* (b)	SUF** [(a)/(b)]	IABDI ***
1981	5165	181.3	28.5	-	**1996**	7296	251.8	29.0	999
1982	5031	191.8	26.2	-	**1997**	7685	261.1	29.4	961
1983	4837	180.5	26.8	-	**1998**	7630	264.6	28.8	678
1984	5508	196.9	28.0	-	**1999**	7636	263.7	29.0	766
1985	5674	208.8	27.2	912	**2000**	8134	271.8	29.9	1119
1986	5645	202.2	27.9	695	**2001**	8253	279.8	29.5	827
1987	5939	201.7	29.4	984	**2002**	8471	288.7	29.3	766
1988	6296	209.3	30.1	1263	**2003**	9237	297.1	31.1	1726
1989	6516	215.8	30.2	1377	**2004**	9978	313.7	31.8	2882
1990	6556	219.1	29.9	1161	**2005**	10659	338.2	31.5	2082
1991	6737	223.2	30.2	1308	**2006**	11314	359.6	31.5	1905
1992	6584	221.9	29.7	979	**2007**	12394	384.1	32.3	4124
1993	6700	227.5	29.5	1104	**2008**	12797	409.1	31.3	3613
1994	6792	235.8	28.8	1138	**2009**	12973	430.5	30.1	1468
1995	7394	244.5	30.2	1525	**2010 (E)**	14451	508.4	28.4	1532

(*) BTM: Billion Tonne Miles of Cargo Carried. Fleet in dry in million tonnes deadweight.
(**) Thousand Cargo Miles Transported Per Operating Tonne Deadweight.
(***) IABDI: BDI inflation adjusted to 1985

Source: R.S.Platou, Drewry Insight, IMF

24 As argued earlier, an important response of shipowners to a fuel price increase is slow steaming, which obviously has important implications on the emissions generated by a given ship. Table 1 above shows the average annual miles that dry bulk cargoes were

2 Devanney, J.W. (2010), "The Impact of EEDI on VLCC Design and CO2 Emissions", Center for Tankship Excellence, USA (www.c4tx.org).

3 Gratsos, G.A. (2010): "Freight market signals in a changing environment: An internal view of dynamic forces that shape the dry bulk business", PhD thesis, University of the Aegean, Greece.

transported by sea per tonne deadweight of operating dry bulk fleet at midyear compared with the inflation adjusted BDI (BFI) Index. It is clear that in good markets the operating fleet travelled greater distances than it did in poor markets. In the 30 years from 1981 to 2010, depending on the freight market, the miles that cargoes are transported for every tonne deadweight of operating fleet varied from a maximum of 32,300 miles in 2007 in a very good market, to a minimum of 26,200 miles in 1982 in a very low market. This difference represents about a 23% maximum fluctuation in cargo tonne-mile per operating tonne deadweight transported, or an equivalent amount of difference in average speed, which would represent about 55% reduction in power and energy consumption of the operating fleet.

25 Similar studies prove the same for the tanker market. Well advertised container ship performance in all shipping newspapers indicates savings in operating expenses including fuel from slow steaming, despite requiring more ships, and profit increases for container lines by reducing speeds to reduce overcapacity and increase freight rates.

26 Thus, the ratio of achieved freight rate to the bunker price is an efficient automatic stabilizer of markets and a method of optimizing consumption, indicating that with an identifiable increase in the bunker price *inter alia* through a levy, a reduction in speed is to be expected and with it, a reduction in emissions.

27 For the reasons stated above, Greece is of the opinion that the GHG Fund proposal has an in-sector GHG reduction potential much higher than its own proposers are willing to admit.

Modelling

28 The efforts by the MBM Expert Group to develop and apply a model to estimate emissions reductions, revenues generated, costs and other attributes of each MBM proposal is appreciated. But reservations are expressed for many of the modelling assumptions. For instance, an illustrative assumption was made that an increase in fuel prices of 100 per cent over the long-term will result in a 4% reduction in emissions below Business As Usual (BAU) (MEPC 61/INF.2, Table 11-1). However, this percentage (4% or other) critically depends on the slope of the Marginal Abatement Cost (MAC) curve at the point it crosses the x-axis. This, Greece believes to be incorrect. As illustrated by the DNV MAC curves for the 72 scenarios examined, that slope can vary widely from very low to very high (projected future fuel price being the main determinant). See for instance MAC curves in annex 10 to document MEPC 61/INF.2. In that sense, Greece has strong reservations on all the numerical results of this model, which are sometimes difficult to follow and, at a minimum, should be interpreted with caution. The same applies to the numerical results that are shown in pages 11 and 12 of document MEPC 61/INF.2. All of these results are to be contrasted to the findings reported in paragraph 22 above, which are quite different.

29 Greece is also of the opinion that it is rather unfortunate that the data and models on the MAC curves supplied to the expert group by DNV are not fully available to scrutiny, as this significantly limits their usefulness. If the model itself is not made available for scrutiny by the experts (remaining virtually a black box) then obviously the correctness of its results cannot be confirmed.

30 To be persuasive, all modelling assumptions and estimates should also be compatible with reality. As an example, in the second IMO GHG Study 2009 (on which the MBM modelling scenarios were based), whereas the total marine fuels used as reported by the IEA were approximately similar to those estimated by the GHG Study Consortium for 1990, the figures estimated by the GHG Study Consortium for 2007 were approximately 70% higher. Bunkers of all specifications are produced by refineries and sold tax free to shipping and variously

taxed for land-based use. The refinery data should be considered accurate as they are substantial national entities. The refinery collects all taxes and passes them on to the state. Leakage can only occur from the tax free provider to the taxed product users through parallel markets. This would have the effect of showing a greater, not a lesser quantity of bunkers sold to shipping by the refineries. Furthermore, in order to produce more bunkers, the refinery would have had to import higher volumes of crude, which would have shown up in national fiscal and trade figures and would therefore have been audited by the authorities. Greece is concerned that modelling assumptions such as these may seriously challenge the correctness of the MBM-EG modelling exercise results.

Grouping of proposals

31 A horizontal comparison of the 10 MBM proposals is included in annex. Greece hopes that this can be useful as a basis of discussion at the Intersessional Meeting and at MEPC 62.

32 The Terms of Reference for GHG-WG 3 (annex 7 to document MEPC 61/24) solicit possible groupings of the proposals. To that effect, Greece suggests the following four groupings:

(A) The GHG Fund proposal by Cyprus, Denmark, the Marshall Islands, Nigeria and IPTA (MEPC 60/4/8).

(B) The three separate ETS proposals by Norway, UK and France (MEPC 60/4/22, MEPC 60/4/26, MEPC 60/4/41 respectively).

(C) Hybrid proposals that include EEDI: Japan's LIS proposal, United States' SECT proposal and WSC's VES proposal (MEPC 60/4/37, MEPC 60/4/12, MEPC 60/4/39 respectively).

(D) All other proposals.

33 In the next two sections, Greece argues why only groups (A) and (B) should be retained for further consideration.

Put on hold group (C) hybrid proposals that include EEDI

34 Under group (C) there are three MBM proposals that are hybrid in that they all include a ship's Energy Efficiency Design Index (EEDI) as part of their formulation. These are: Japan's LIS proposal (MEPC 60/4/37), the United States' SECT proposal (MEPC 60/4/12) and WSC's VES proposal (MEPC 60/4/39). Although very different *vis-à-vis* one another, all three explicitly use the EEDI as part of the overall evaluation of a ship, therefore a grouping of these three proposals is warranted on this common feature.

35 Greece proposes that further discussions on these three proposals be put on hold for the reasons, set out below.

36 First, one's ability to properly evaluate these proposals is limited due to the fact that the EEDI is not yet finalized. Even though the EEDI guidelines have been circulated as proposed amendments to MARPOL Annex VI, and a decision is expected at MEPC 62, significant discussion on several pending issues is still expected, and (serious) concerns on the use of the EEDI still exist.

37 All three of the above MBM proposals use (each in a different way) the idea of rewarding ships that are good environmentally and in all three proposals, the EEDI is proposed as a way to measure such good environmental performance. But practically speaking, a ship with a low EEDI may not be the best ship to reward. It may emit more CO_2 than another ship whose EEDI is higher. For instance, a low EEDI may mean an underpowered ship, which, in its attempt to maintain speed in bad weather, may emit more than a ship with a larger engine (see document MEPC 60/4/17 by Greece). This can be a long discussion, which in Greece's opinion is not appropriate to be held within the context of the MBM debate. The results of the EEDI discussion at MEPC 62 may impact all MBM proposals that are based on the EEDI. Can one properly evaluate these proposals if the EEDI issue is not yet completely closed? In Greece's opinion, the answer is no.

38 Another issue is that even though EEDI is supposed to be a "technological" index dealing mainly with design issues intended to reduce emissions from new ships by having good hull forms, efficient engines propellers, etc., the adoption of a hybrid proposal would make the EEDI applicable to existing ships via the MBM mechanism. Thus, EEDI will impact both existing and new ships, and in two different but parallel ways:

.1 New ships will be impacted in two ways, one direct (according to whatever provisions will be adopted as a result of the EEDI deliberations) and one indirect (via the provisions of the hybrid MBM proposal).

.2 Existing ships will be impacted in one way, indirectly, only via the provisions of the hybrid MBM proposal.

A combination of .1 and .2 above will accelerate the marginalization of the majority of older ships in the world fleet, at a great cost to society.

39 Thus, Greece believes that the hybrid proposals are likely to create confusion and perhaps also create competitive distortions if adopted. For one thing, reciprocal adjustments would be warranted to whatever MEPC 62 might finally conclude on EEDI, if it is known that EEDI will also be used for existing ships via an MBM mechanism. The MEPC went at great lengths to decide that EEDI is only applicable to new ships. But with the proposed mechanism, it will have an influence on existing ships as well. So if this avenue is pursued, an adjustment to the deliberations of MEPC as regards EEDI may be warranted, to take this into account. There is currently no provision for such an adjustment.

40 In any case, and in view of the comments in the preamble, a distinct cost on carbon through a carbon levy would have automatic speed reduction, energy and cost optimization effects on all ships. Furthermore, it will be the strongest driver for ship operators, including charterers, to apply whatever technological modifications which are cost effective in practice (not only on a paper EEDI calculation).

41 For the above reasons, Greece proposes that discussion on the three hybrid MBM proposals mentioned above be put on hold, at least until EEDI is finalized and the points raised above are clarified. It is noteworthy that Japan's hybrid LIS proposal has a close relationship to the GHG Fund proposal, but only if the part that deals with EEDI is discarded.

Eliminate all proposals of group (D)

42 These include Jamaica's STEEM (PSL) proposal, IUCN's rebate mechanism and the Bahamas' proposal, all of which are analysed in the ensuing paragraphs.

Jamaica's proposal

43 Jamaica (MEPC 60/4/40) proposes that Member States participate in levying a uniform emissions charge on all vessels calling at their ports based on the amount of fuel consumed by the respective vessel on that voyage. Although in principle the approach has merit in that it aims to internalize the external costs of CO_2 emissions, important questions regarding its practical implementation can be raised.

44 Monitoring actual emissions is very challenging, even though it is certainly feasible technologically. Even past emissions of the world fleet (such as those carried out for the second IMO GHG Study 2009) are estimated using modelling. The idea of measuring emissions produced for each segment of a ship's journey, plus those in port, for all of the world fleet, is a laudable one, but in Greece's opinion the measuring of emissions cannot yet be done in a cost-effective manner taking into consideration all the pertinent parameters. Here it should also be noted that there are large discrepancies between the consumption modelled and the actual bunkers sold worldwide which give rise to important questions.

45 Another significant problem is that, Member States that choose not to participate in this system or that lack proper monitoring and enforcement mechanisms, run the risk of evolving into "mega hubs" of shipping traffic, for the sole purpose of catering to the needs of those who want to evade the scheme. Other than carbon leakage, this would create competitive distortion, distortion in trade flows and a non-level playing field among both shipping companies and ports. Also, phased implementation would create all kinds of transient distortions, which are likely to continue indefinitely.

The IUCN proposal

46 The main focus of the IUCN proposal (MEPC 60/4/55) is a rebate mechanism which its authors claim to be compatible with the "common but differentiated responsibility" principle under the UNFCCC, while in principle it can be applied to any type of MBM. The examples given, however, refer to a market-based fuel levy, with upper and lower bounds on prices. In that respect, the proposal has some common elements with the GHG Fund proposal (option 2). The rebate mechanism uses a country's share of global imports as a key without specifying which imports. Here it should be noted that the emissions from imports of container ships per tonne of cargo carried are very different from those of bulk carriers or tankers which would make the rebate mechanism very cumbersome.

47 In principle such a system might work, provided the implementation of the rebate is carried out in a fair way. If a market-based levy is used as the MBM, a potential problem concerns the fluctuations of the carbon levy, even though these are constrained by the upper and lower bounds on price. In that respect, the GHG Fund scheme provides higher investor certainty (unless of course upper and lower bounds are very close or coincide).

48 It is noted that the market-based levy is set constant for a quarter, thus reducing some of the carbon price volatility for the shipping sector. According to its Terms of Reference, the MBM Expert Group had little or no freedom to suggest modifications to MBM proposals, or even to combine them, perhaps choosing the best elements of each. If such a freedom existed, a proposal would be to keep the levy constant for a longer period of time, and also the ceiling and floor prices. Investments in ships are greater than 20 year investments. Setting the levy constant for a quarter is too short a period to provide investment certainty and is therefore not practical.

49 The administrative costs for a MBM with a Rebate Mechanism will of course be higher. They will be those of the MBM system chosen, plus those of administering the rebate system.

50 The proposal appears to try to improve the GHG Fund giving it a certain degree of flexibility which obliterates the price certainty inherent in the GHG Fund as proposed. Price certainty is the reason why the levy will focus the mind of shipowners or operators on fuel conservation and emission reduction measures, including the automatic speed reduction through the ratio of the freight rate to the bunker price to achieve the optimum trading speed. The rebate mechanisms will most probably contain assumptions leading to unfairness and will prove to be complicated and therefore liable to fraud.

The Bahamas proposal

51 The original Bahamas proposal (MEPC 60/4/10) advocates adopting no MBM proposal, arguing that this would be an obstacle to trade. Looking at this proposal from another angle, the Marginal Abatement Cost Curves (MACC), that have been produced by DNV for MBM-EG, have a portion that has MAC less than zero. The measures corresponding to MAC less than zero entail a negative cost (that is, a profit) to the shipowners, meaning that they would be implemented without someone forcing them to do so. Measures with a negative abatement cost would achieve a specific CO_2 reduction. The Bahamian proposal, although not following the MACC approach, nevertheless leads to a similar recommendation.

52 Greece does not agree with the new Bahamas proposal (GHG-WG 3/2), which appears to subscribe to the Expert Group report's "key assumption" that owners of ships on time charter or bareboat charter have less incentive to reduce fuel consumption since the fuel is paid by the time charterer and not the owner (MEPC 61/INF.2, paragraph 8.12). As explained earlier, Greece considers this assumption to be wrong.

53 Furthermore, in view of the fact that ships trade at different speeds according to the market conditions, as shown in Table 1, collection of data for three years "to make a rolling average figure for that particular ship" will be difficult to extrapolate as the ship, during that three-year period may be trading either faster or slower because of market conditions. Greece questions whether it would be possible to establish a reliable Energy Efficiency Operational Indicator (EEOI) for any ship with just two to three years of data, especially in the tramp/bulk sector. Also it is challenging to establish EEOI baselines for various ship segments (type and size). In addition, sister ships can have vastly different EEOIs, due to their trade pattern. The main influence on the EEOI value is the weather and the distance of ballast legs. That is why it was agreed that an EEOI baseline or EEOI limit value cannot be established and that a demonstration by owners that they track their emissions by calculating their EEOI and that they make an effort to reduce such emissions suffices. Just tracking your fuel consumption – since calculating your EEOI will be mandatory – could lead to saving fuel.

Comparison between groups (A) and (B): Levy Scheme (GHG Fund) *versus* ETS

General considerations

54 Greece has identified a number of documents published by prominent organizations that compare the Levy Scheme and ETS in both a general context and in specific applications. Below is a brief and non-exhaustive discussion.

55 The United States Congressional Budget Office document "Policy Options for reducing CO_2 emissions"[4] compares cap-and-trade with a Levy Scheme. The CBO paper compares the efficiency and CO_2 reduction potential of ETS *versus* Levy Scheme (including a worldwide levy) and concludes that a levy on emissions would be the most efficient

[4] Available at: http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf.

incentive-based option for reducing emissions and could be relatively easy to implement. It goes on to conclude that the environmental net benefits of a levy could be roughly five times as high as the net benefits of an inflexible cap. Further analysis in the said study shows that the CO_2 reductions would be nearly twice the amount with a Levy Scheme than with a cap and trade scheme. Another US CBO document on the subject, with a useful summary, arrives to a similar conclusion[5]. In other words, and according to CBO, a levy can bring the same environmental result (alternatively: can have the same environmental impact) at half the price of an ETS or even less.

56 Two recent Friends of the Earth (FOE) reports adopt a similar stance. FOE (2009)[6] identifies six central problems with carbon trading, namely that it is ineffective at driving emissions reductions, it fails to drive technological innovation, it leads to lock-in of high-carbon infrastructure, it allows for, and relies on, offsetting, it creates a risk of subprime carbon, and it provides a smokescreen for lack of action on climate finance by the developed world. The authors reject the argument that the disappointing record of attempts to construct carbon markets is due to "teething problems" or because insufficient efforts were made. Rather, they demonstrate that the carbon trading architecture is fundamentally unfit for the purpose and cannot possibly deliver the stabilization of atmospheric GHG concentrations within a given timeframe that the scientific community is calling for.

57 FOE (2010)[7] outlines why carbon trading is not the solution to climate change and sets out some of the real solutions for cutting GHG emissions and delivering climate finance. It calls on national governments to urgently dedicate time and resources to develop and implement these and other more viable, equitable and effective solutions to the climate crisis. Among the measures proposed, an EU-wide carbon tax and a graduated "Starter Tax" in the United States could bring in $200 billion together per year. Making only a quarter thereof available for climate finance could provide more than $50 billion per year. A levy on international aviation could bring in an additional $10 billion per year. A conservative estimate of the revenue-generating potential of these finance solutions indicates that they could provide new and additional climate finance for developing countries of at least $420 billion per year. A further problem noted is that an international ETS infrastructure system will require several years to implement (perhaps a decade) whereas a levy can be implemented in few months.

58 Policy Exchange (2010)[8] puts forward the case that a carbon tax is the most cost-effective measure to reduce CO_2 emissions. This report has two sections, both of which address the question of how to improve United Kingdom's carbon reduction policy. Exploring the relative theoretical and practical merits of carbon permit trading and carbon taxation, the report makes a strong argument for taxation, given the likely shape of the damage and cost functions associated with climate change – and the possibility that, in choosing a quantity-based approach one might easily pick the wrong quantity. A tax may enable a more long-term, credible carbon price to be established.

59 Last but not least, in a Wall Street Journal article on cap-and-trade[9], the creators of the ETS express reservations on the scheme's usefulness.

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5 available at http://www.cbo.gov/ftpdocs/80xx/doc8027/04-25-Cap_Trade.pdf.

6 FOE (2009), "A dangerous obsession: the evidence against carbon trading and for real solutions to avoid a climate crunch" Friends of the Earth report, 2009. Available at: www.foe.co.uk/resource/reports/dangerous_obsession.pdf.

7 FOE (2010), "Clearing the air: moving on from carbon trading to real climate solutions" Friends of the Earth report, 2010. Available at: www.foe.co.uk/resource/reports/ clearing_air_summ.pdf.

8 "Greener, cheaper" Contributing authors Dr Robert McIlveen and Professor Dieter Helm (Univ. of Oxford), Policy Exchange, 2010.

9 Available at http://online.wsj.com/article/SB125011380094927137.html.

Certainty in cap vs. certainty in price

60 One of the main selling points of the various ETS proposals in document MEPC 61/INF.2 is what is claimed as "full certainty on the emission reductions achieved by the mechanism", that is, if one sets a cap on emissions, that cap will absolutely be met. Let us assume for the moment the claim is correct and the cap is enforceable[10].

61 The question then is what should be the cap? For somebody to select it, he or she will have to know what the costs and benefits will be for that particular selection, so that this selection is better than another selection. In a sense, the correct level of reduction is the level at which the costs of further reduction are larger than the benefits of that additional reduction. Unfortunately, no one knows what that level is. Norway has outlined a methodology for choosing a cap in document MEPC 60/4/23, but if one reads that document it is apparent that there are many uncertainties in computing costs and benefits. So, absolute precision in meeting a cap, if it is unclear what the cap should be, is a problem, and in Greece's opinion makes that feature less credible. And if a cap is set wrong, it is difficult to change.

62 On the other hand, even though one may reach the selected cap, the carbon price that will be established will be completely unknown, being a function of future supply and demand for carbon. All carbon forecasting reports are based on assumptions and have many caveats, and so far forecasts have not proven accurate. They are subject to all kinds of unpredictable factors, political or other. In the University of Cambridge study (MEPC 60/INF.21), the ETS price starts at $177 per tonne and then skyrockets to $3,200 per tonne. It can go the other way too. EU-ETS carbon prices have dropped precipitously as a result of the recent economic crisis and (perhaps) as a result of too many allowances being issued.

63 One way around this uncertainty is an upper (and/or lower) bound on the carbon price (a "safety valve"[11]). If this is the case, the certainty in emission reduction level will disappear. Price uncertainty will also serve as a serious disincentive for long-term CO_2 reducing technology investments. By contrast, in the Levy Scheme, the carbon price (say, $100 or $150 per tonne of fuel) will be known in advance, and investors like shipowners will be able to react to it more rationally.

64 In short, with ETS one gains some cap certainty (with all the previous caveats) and lose price certainty. With a Levy Scheme, one gains price certainty and can always alter the price to achieve the cap, at least approximately. Investors will respond to price, not cap.

Bulk shipping under ETS

65 The advantages of ETS are overstated. MBMs for shipping will not provide direct certainty on environmental outcome; environmental benefit may come only indirectly through offsetting of emissions.

66 An ETS system does not take the structural, operational and contractual complexities of bulk shipping into account. Hence, ETS will not be cost-effective for the vast majority of companies which are engaged in the bulk trades. On the contrary, it will create a heavy and unwarranted administrative burden. The bulk shipping industry has predominantly private small and medium sized companies engaged in the transportation of homogeneous dry bulk cargoes such as coal, grain, iron ore, cement and wet (bulk) cargoes such as crude oil, oil products and chemicals on a voyage by voyage basis. Around 75% of the world fleet

[10] This may be a big assumption. It is suspected that the costs of enforcement will be on the high side. Also, as the cap is being reached, carbon price may skyrocket, even years before the cap is reached. Market fears and expectations may skyrocket prices, which may in turn collapse for any political reason.

[11] As for example the US Kerry-Lieberman Bill.

are bulk carriers, tankers and general cargo ships. Because the economic cost is not known in advance, the impact on bulk/tramp shipping will be more severe, as commercial and financial planning will be undermined. In view of the nature and pattern of tramp shipping operations it is inconceivable how tramp shipping can be brought under any ETS and how the complex problem of emissions allocation could be addressed and resolved.

67 The proponents of ETS assert that it promotes innovation and technological improvements. However, most shipping companies do not have resources to individually fund better ship and engine designs and will not secure this through emissions trading. Therefore, ETS will not be conducive to achieving the long-term objective of zero-carbon shipping as it could take funds away from shipping that could be used to that end.

68 Under ETS the carbon price will be set by the "market" and dictated by it. Hence, ETS permit prices will fluctuate and are therefore unpredictable. Moreover, an ETS or similar scheme would be more unsuitable and ineffective for the shipping industry, if third parties outside the maritime sector, such as financial institutions and/or futures trading houses, were permitted to engage in the emissions trading process. Under such a system, the emissions trade would become a zero sum game with some trading counterparts gaining at the expense of others. Those counterparts having the greater expertise in futures trading, including financial institutions and, possibly, large, multinational corporations, with ancillary shipping activities would be most likely to benefit at the expense of other smaller companies. Such gains and losses would pass from one counterpart through the emissions trading transaction to the other, with no benefit, whatsoever, to the environment. This would also create additional distortion of the competitive environment within the maritime sector, which should be avoided at all costs. Not to mention the very real possibility that such speculative trading (which is unavoidable) may lead to a "subprime" bubble with known disastrous results for shipping and international trade and prosperity.

69 There are a number of significant issues to resolve for a global ETS (via IMO) to become a viable reality. In particular, decisions would be needed on such issues as proper allocation criteria, thresholds, setting the global cap, types of ship, addressing evasion possibilities via transhipment and geographical scope. Reaching agreement internationally on such criteria would be complicated and would have to be in line with other relevant international agreements. It is clear that an environmentally effective, cost-effective and fair global ETS for shipping is highly unlikely.

70 Bulk cargoes can be imported from various sources. They are relatively inexpensive and the cost of transport can have a decisive effect on their sourcing decision. An ETS will not clearly identify the carbon footprint of this sourcing in order to affect the receiver's decision. A levy, because of its direct linkage to the fuel burned for the specific voyage, will. In this respect, a levy will help influence the sourcing decision, effectively creating an incentive to reduce the tonne-miles of transport required. This is a further effectiveness of the levy to its substantially greater efficiency noted in paragraph 55 above.

Administrative burden

71 The ETS scheme's administrative costs are likely to be substantial. Those for the levy are far simpler and therefore smaller. Those for ETS certainly include all those administrative costs associated with Option 2 of the GHG Fund proposal (the one which is ship-based), plus, many more additional costs associated with issuing the allowances, trading, monitoring compliance, avoiding fraud, and others.

72 Taking the bareboat or term charterer issue as an example. While a ship is on bareboat or term charter, the charterer is the effective owner. He decides where the ship goes and at what speed. Legally, he is the disponent owner. This is recognized in the

charter party which puts fuel expense on the charterer's account. If an ETS is going to impact the charterers' speed decision, it has to be recognized in the charter party. This means a shipping ETS not only has to do all of the above, but it also has to keep track of whether or not the ship was on charter and, if so, who the charterer was when the fuel was purchased. Also a chartered ship can be sub-chartered, and so on. Finally, when the ship goes on charter, the real owner sells the fuel on board to the charterer and buys the remaining fuel on board at the end of the charter. The link between fuel purchaser and fuel consumer becomes very difficult to track down.

73 If alternatively the ETS ignores the ship's charter status and requires permits from the owner for all the oil consumed on his ship regardless, looking to the owner to recover the permit cost from the charterer, this would put the owner in an untenable position. He would be responsible for emissions from bunkers which are not his, and permit expenses over which he has no control, and which in many cases are not known until well after the charter is complete. In this way the uncertain price of the permits would not influence the charterer to reduce speed in order to reduce fuel consumption. All of this is a non-issue for a Levy Scheme, as it is indifferent who purchases the fuel or how it may change hands on board. Whoever pays for the fuel also pays the levy. Furthermore, to avoid possible complications the levy could be paid at source, that is, at the refinery level. The refinery in all cases is a substantial national entity which would provide confidence for the true collection of the levy.

Carbon leakage, evasion and fraud

74 Maybe the only way to keep the administrative burden from skyrocketing to an arbitrarily high level would be to place limits on coverage, e.g., limit the scheme to ships above a certain size. In fact, this is precisely the reason these limits are suggested in the ETS proposal. If all ships are included the scheme would be unmanageable. There is no indication what the size limit would be. According to the Second IMO GHG Study 2009, if the limit were to be set at 10,000 GT, it would amount to 16,000 ships covering some 67% of total CO_2 emissions. Thus, side-effects of any limit would be that a percentage of the fleet would be exempted and hence produce CO_2 without regulations. One may see additional side-effects like many ships of 9,900 GT being built if the limit is 10,000 GT. But even then, even if 16,000 ships were to be included instead of 60,000 (the number of ships if the limit is set at 400 GT), it would still be a very heavy burden.

75 Avoidance of carbon leakage is likely to be problematic in ETS. One reason is the high number of exemptions built into the scheme. Already mentioned is the problem associated with the ship size cut-off. Another exemption would be that of cargoes associated with small island developing states (SIDS). This could result in traffic being diverted to these countries which could develop into mega transhipment hubs, just for the purpose of emissions exemptions. As stated by Australia in document MEPC 58/4/23: "*Given the vast majority of world tonnage is registered in non-Annex I countries, effective international action on shipping emissions requires all countries to make a concerted effort to mitigate emissions and all ships in international trade should be covered. Any other approach risks the distortion of international shipping markets, could promote leakage to shipping sectors not covered, and/or could promote modal shifts, thereby creating perverse environmental outcomes.*"

76 Greece thus thinks the potential for evasion is substantial under an ETS. Also, already several fraud cases have been reported within the EU-ETS and elsewhere[12].

[12] See, for instance: http://www.reuters.com/article/idUSTRE62P5E420100326.
http://www.probeinternational.org/carbon-credit-watch/carbon-credit-scams-add-growing-list-alleged-fraud-cases
http://www.environmentalleader.com/2010/01/07/australia-belgium-find-more-cases-of-carbon-fraud/.

Experience from other contexts

77 Even though similarity of ETS with other trading systems is claimed, these other systems concern really different industries, mostly land-based, which do not operate on an international basis. There is nothing comparable to international shipping. Even aviation is different, for much of the trading that exists in the maritime mode does not exist in aviation.

78 A system that does indeed operate on an international basis is the EU-ETS. This scheme began operation on 1/1/2005 and now covers more than 10,000 installations and approximately half of the EU's CO_2 emissions, being the world's largest company-level "cap-and-trade" system for trading in emissions of CO_2. All 27 EU Member States participate fully in the scheme as well as Iceland, Liechtenstein and Norway. The system currently covers CO_2 emissions from large emitters in the power and heat generation industries and in selected energy-intensive industrial sectors.

79 For the countries for which data was available (all 27 Member States excluding Romania, Bulgaria and Malta), EU's CO_2 emissions increased by 1.9% between 2005 and 2007. Moreover, the jury is still out on the long term prospects. In 2009 emissions fell by 11.6%, but this is mainly attributed to the economic crisis. By contrast, one may look at the example of Sweden. In 1991 they adopted a carbon tax. The Swedish Ministry of Environment has estimated that Swedish GHG emissions per GDP are 20 to 25% lower than they would have been without the tax [13].

80 The structure, economics, legal regime and role of the industries covered by the EU-ETS are very different from the equivalent attributes of international shipping. Ships and shipping companies can easily relocate and the concept of cross-trading, very much prevalent in international shipping, is nowhere to be seen in the sectors covered by the EU-ETS. That alone might render any allocation scheme unfair and subject to misuse. It is fair to say that the differences between the two sectors are higher than the conceivable similarities.

Conclusions

81 For the reasons stated in previous sections, if the IMO agrees to adopt a MBM to reduce GHG emissions, Greece supports a Levy Scheme as the most efficient means to do so. Greece further believes, based on all available research and record of existing ETS schemes, that an effective ETS scheme for international shipping is unattainable.

Action requested of the Intersessional Meeting

82 The Intersessional Meeting is invited to consider the information provided in this document and take action as appropriate. In particular, it is invited to endorse Greece's recommendation to leave on the table only groups (A) and (B) of the MBM proposals (as those were defined earlier), and proceed to an in-depth comparative assessment of these two groups.

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[13] For Sweden, see http://www.oecd.org/dataoecd/25/0/2108273.pdf and http://www.guardian.co.uk/environment/2008/apr/29/climatechange.carbonemissions. For other countries, see http://www.carbontax.org/progress/where-carbon-is-taxed/.

ANNEX

HORIZONTAL ASSESSMENT OF ALL MBM PROPOSALS

1 The set of Tables 1a and 1b below represents Greece's opinion on how each of the MBM proposals stands with respect to the main criteria and some other criteria. Comments on criteria 6 (compatibility to UNFCCC and other international laws) and 9 (compatibility with existing IMO framework) have been omitted as they are covered by the Report of the Expert Group. Due to space limitations, each table only covers 4 proposals. The ETS proposals are combined.

Table 1a

Main criterion	GHG Fund (Denmark)	Leverage Incentive Scheme (Japan)	ETS (Norway, UK, France)	SECT (USA)
1 Environmental effectiveness (certainty of a MBM achieving specific reduction target)	There may be less certainty of CO_2 reductions than ETS, but MAC curves of DNV can give an estimate. If the price is the same, the CO_2 reductions are the same as the ETS*. Offsets can contribute to meeting a target. * assuming equal cost effectiveness which not the case.	Lower than GHG Fund, but may have side-effects due to possible distortions induced by misuse of EEDI (e.g., an underpowered ship has a low EEDI but may emit more CO_2).	There may be higher certainty of CO_2 reduction, but the reduction target is arbitrary (or difficult to determine). Plus, enforcing the cap can be difficult and carbon price may skyrocket if close to the cap. Significant carbon leakage risks exist (e.g., if not all ships are covered, some countries like LDCs excluded, etc.).	Low. CO_2 reduction certainty does not exist, as the scheme trades on EEDI. No attempt to compute CO_2 directly.
2 Cost effectiveness	High. Costs are known as price is known. Simplest scheme (except Bahamas). According to several studies, levy is most efficient way to reduce emissions.	High, but lower than GHG Fund, due to costs of tracking EEDI.	Low. High administrative costs, very unpredictable carbon price.	Low. Combines problems of ETS with EEDI distortions and other problems.
3 Incentives to technological change	High. Investors will respond to known price.	High, but lower than GHG Fund, due to possible mixed EEDI signals (e.g., invest in underpowered ships).	Low. Investors will not know what future prices they will encounter and will pay high administrative costs.	Same as above. May provide the wrong signals in favour of low-EEDI ships than may emit more CO_2.

Main criterion	GHG Fund (Denmark)	Leverage Incentive Scheme (Japan)	ETS (Norway, UK, France)	SECT (USA)
4 Practical feasibility	Reasonable. Can be modelled from IOPCF.	Lower than GHG Fund, due to tracking of EEDI for existing ships.	Low. All GHG Fund (option 2) processes, plus auction permits, monitor allowance market, enforce compliance, indentify fraud, etc.	Worse than ETS. Combines problems of ETS with tracking EEDI for existing ships and estimating activity levels.
5 Impact on LDCs and SIDS	Neutral. From a revenue perspective, if prices are same, revenue is same as ETS.	Same as GHG Fund although the scheme will likely benefit developed countries more (as these are more likely to have low EEDI ships).	A distortion likely, as traffic to LDCs and SIDS are exempted, which may lead to traffic being diverted through these countries.	Neutral.
6 National administrative burden	Reasonable. Tracking bunkers is not trivial but burden is lower than all other schemes (except Bahamas).	Higher than GHG Fund.	Significant. High admin. costs to track, monitor, enforce, avoid evasion and fraud, etc. If all ships in the scheme, impossible to implement.	Worse than ETS.
7 Administrative burden on industry	Same as above.	Higher than GHG Fund.	Same as above.	Same as above.
OTHER CRITERIA				
8 Impact on safety	Neutral.	Problem if under-powered ships are advocated due to low EEDI.	Neutral.	Problem if under-powered ships are advocated due to low EEDI.
9 Risk of fraud	Average. Low at refinery level.	Average.	High- documented cases in EU-ETS and elsewhere.	Higher than GHG Fund.
10 Money collected	Limited to in-sector contributions. Depends on level of levy.	Same as GHG Fund minus difference in admin. Costs – some of the proceeds go to ships of low EEDI.	If GHG Fund Levy and ETS carbon price are same, amount of money collected for ETS is same as GHG Fund minus difference in administrative costs.	Depends on price of EEDI traded.

Table 1b

Main criterion	VES (WSC)	Rebate Mechanism (IUCN)	Port Levy (Jamaica)	Penalty on trade (Bahamas)
1 Environmental effectiveness (certainty of a MBM achieving specific reduction target)	Problems due to possible distortions due to use of EEDI. Preferable to SECT.	Proposal piggybacks any MBM that generates funds. Its environmental effectiveness is same as that of the associated MBM.	Approach has theoretical merit but implementation difficulties. Carbon leakage risk. Some port states may not implement scheme.	As shown by MAC curves of DNV, some non-trivial CO_2 reductions can be achieved even with no MBM.
2 Cost effectiveness	Same as above.	Lower than that of the associated MBM.	Lower than GHG Fund due to port State control.	High for high fuel prices, low otherwise.
3 Incentives to technological change	Unclear – maybe higher than SECT but risk of wrong signals due to EEDI.	Lower than that of the associated MBM, as price will be less predictable.	High if implemented globally, but that is the key difficulty.	Owners will implement measures with MAC<0 anyway.
4 Practical feasibility	Higher than SECT but lower than GHG Fund, due to the tracking of EEDI for existing ships.	Lower than that of the associated MBM (add costs of administering rebates).	Low. Practically impossible to monitor emissions.	Highest.
5 Impact on LDCs and SIDS	Neutral.	Could be beneficial to LDCs and SIDs if levy is based on imports.	Unclear. May create distortions by diverting traffic to port states not implementing scheme.	Neutral.
6 National administrative burden	Lower than SECT, but higher than GHG Fund.	Higher than that of the associated MBM (add costs of administering rebates).	High.	Zero.
7 Administrative burden on industry	Lower than SECT, but higher than GHG Fund.	Same as that of the associated MBM.	High.	Zero.
OTHER CRITERIA				
8 Impact on safety	Problem if under-powered ships are advocated due to low EEDI.	Neutral.	Neutral.	Neutral.
9 Risk of fraud	Higher than GHG Fund.	Average.	High.	N/A.
10 Money collected	Depends on level of Fee.	Similar to that of the associated MBM – minus difference in admin. costs.	Depends on level of port levy. Have to deduct high admin. costs.	Zero.